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PSYCHOLOGY AND SCIENTIFIC METHODS

THE EMPIRICAL CORRELATION OF MENTAL AND BODILY PHENOMENA

SINCE the days when Descartes placed the soul in the pineal gland to deflect at will the course of the animal spirits and his successors formulated in return the elusive dogma of parallelism, mankind's conceptions of the soul and its relation to the body have remained fundamentally unchanged. The modern substitute for the Cartesian view is framed, it is true, in the light of a riper knowledge of the physiological structure of brain and nerve; but the difference between a soul which controls the mechanical action of the brain through a pineal gland and one which operates more obscurely at the synapses, raising and lowering the resistance to nervous discharge to effect its purposes, is not a fundamental one. Nor, on the other hand, has the advance in science essentially altered the conception of parallelism. Upon the familiar and dreary round of argument and counter-argument through which the long controversy between interactionism and parallelism has worn itself out, we shall not enter. The issue is not decided but it is no longer a living one. A growing sense of its futility has come upon us. It has survived so long because the only alternative to the conception of mind as a being or activity distinct from the body which has seemed possible has been the identification of the mental with the physical. In the last few years, however, changed perspectives have brought into fresh relief the unsurmounted, and, I venture to say, unsurmountable difficulties which oppose the belief in a transcendent soul, or a conscious existence *sui generis*. The conviction has gained ground among us that such a belief is a survival of older modes of thought, in other fields happily outgrown. But to cherish this conviction is to face the task of finding new terms in which to read the empirical facts which the older conception imperfectly embodied. The newer movements of our own day, pragmatism, neo-realism, behaviorism, have all been, in part at least, motivated by the need for such philosophic and scientific reformulation. And amid all the confusion of present-day controversy there is to be discerned, we believe, a meas-

ure of common achievement, not yet consummated, nor capable of precise definition, but the foundation for an intellectual advance as momentous possibly as that marked by the philosophy of Descartes.

It is the purpose of this paper to examine how psychological phenomena such as emotion and perception are empirically correlated with the functioning of the nervous system. The alternatives with which we are familiar are either that for every change in conscious experience there is to be found a corresponding change in the chemical and physical processes taking place in the cerebrum; or else, that while many of the simpler conscious processes may be initiated by cerebral changes and in turn modify such changes, no general or complete correlation is to be made out between conscious experience and nervous action. These alternatives are not, as I shall try to show, exhaustive, nor is either of them an adequate description of the empirical facts. What they both falsely presuppose is that, if there is any systematic correlation between conscious experience and the functioning of the nervous system, it must be between psychical processes and the physical or chemical changes taking place in the brain. Or, in other words, it is taken for granted that the nervous system is adequately describable as a physiological organ and its functioning as a complex set of physical processes.

We find this point of view most clearly expressed in such nineteenth-century thinkers as Huxley or Tyndall. Both scientific investigators of the first rank, they were deeply impressed by the fact that research into the processes of organic matter reveals nothing but natural forces. Even the nervous impulse is nothing but chemical reaction. We do not, says Tyndall, possess the organ, nor the vestige of an organ, which enables us to pass from the mechanics of the brain to the corresponding feeling. Thus he was led to a parallelism which could point to a possible connection between a left-hand spiral motion and the emotion of love. This undoubtedly was a bit jocose, but it fairly represents the categories to which the speculation of his generation was limited. Bound to such limitations what, indeed, is left but an *Ignorabimus* before a final mystery?

It is in keeping with this mode of thought to speculate further as to the consequences of producing in a test tube the highly complex and unstable molecules of a brain cell and stimulating them to reactions identical to those occurring in the brain of a living being. Might there not at the same time be produced a throb of simple consciousness? If such speculations as these have not been often openly indulged in, it has been common sense and not theoretical insight which has prevented. Even so modern a writer as Münsterberg is able to postulate an ultimate conscious element, simpler than the sen-

sation, and corresponding to the reaction of a single cerebral cell as its compound, the sensation, corresponds to the reactions of a localized group of cells.

This view of Münsterberg's, however, may properly be said to represent an alternative interpretation of the correspondence theory. We may distinguish it from the psycho-*physical* parallelism of Tyndall, by the title psycho-*physiological* parallelism. According to this more cautious interpretation, the correlative of a specific mental process is not a geometrical figure of the dance of brain atoms, nor even necessarily a particular chemical reaction, but the occurrence of similar physiological processes in definite physiological structures. The classic doctrine of specific energy is an example in point, and indeed a large part of what goes under the head of physiological psychology belongs to this view of the mind-body relation. This form of parallelism offers certain advantages over the cruder psycho-physical formulation. It is less doctrinaire. It does not commit one to the extremes of kinetic mechanism; and it has far more regard for empirical facts. Theoretically, however, such a doctrine as that of specific energy leaves us face to face with as final a mystery as that which confronted Tyndall. And as I shall try to show it is not verified, nor verifiable, by available empirical evidence.

In a sense the contention of parallelism is acceptable. For every change in psychical processes there doubtless is a change in the processes going on in the cortex. But it is equally true that for every change in psychical processes there is a change in atmospheric currents. To make the concomitancy of psychical and cortical change a significant *correspondence*, which is what parallelism claims, it is necessary to establish that the characteristic groupings, or *phenomena*, which the one presents are traceable in the other also, and that a repetition of a feature of the one matches a repetition of the corresponding feature of the other. What makes parallelism in whatever form so paradoxical a doctrine is the fact that it assumes the phenomena of nervous action to be individuated and determined by an entirely different set of principles from those by which the supposedly corresponding phenomena of conscious experience are individuated and determined. That there is a correspondence of some sort between the phenomena of conscious life and the functioning of the nervous system we should all admit. The question is: Of what nature is it? In what terms are the phenomena of nervous function which correspond to the phenomena of conscious life to be described? What the mind-body problem demands for its solution is the exhibition of a principle of individuation and classification common to the two. To accomplish this would in truth be not to solve the

problem but to show that its very formulation depends on untenable assumptions. For to show that two supposedly disparate systems of phenomena are individuated and classified by a common set of principles is to exhibit them not as two but as one single system of phenomena.

The clue of which we are in search lies, I believe, close at hand. It is to be found in the simple insight that the central nervous system is not primarily a physiological organ. Its function is only secondarily to maintain the inner equilibrium of bodily processes which constitutes the living as opposed to the dead being. Its primary function is the adjustment of the behavior of the individual as a whole to the outer world of goods and dangers which constitutes his environment. It is in the performance of this wider function that we must find the correlate of feeling and thought, rather than in the stimulation of neurone and ganglion. It is true that each act in the performance of this function is controlled by the stimulation of neurone and ganglion. But the uniformities of function, the characteristic *phenomena* which correspond to psychological uniformities are not describable in physiological terms.

This has been strikingly, although perhaps unintentionally illustrated for us by Professor John Watson in a recently published article, "On Behavior and the Concept of Mental Disease." A distinction is commonly made by alienists, so Professor Watson tells us, between such mental disorders as are conditioned by cortical lesions, or physiological disturbance of cortical function, and those for which no physiological cause can be assigned. These last are commonly called mental or "strictly mental" disease. Such a case might be, for example, an individual who ordinarily comported himself in conventional fashion, but whom religious service, instead of inspiring to appropriate devotional attitude and behavior, irresistibly impelled to the loud utterance of outrageous and ribald remarks. What Professor Watson urges is that such cases as these are not purely mental in the sense that there is no correlative misfunctioning of the central nervous system. Many such cases he describes as wrong "habit complexes." Now inappropriateness of habitual behavior is evidently not to be identified with physiological disturbance, although it is as evidently due to the failure of the cortex to function properly. If Professor Watson is right, it is evident—though he himself apparently does not draw the conclusion—that normal and abnormal functioning of the cerebral cortex may be distinguished, not on the basis of any determinable physiological differences, but by the relative appropriateness of the cerebrally controlled behavior to environmental—say even social—conditions.

The characteristic uniformities which the functioning of the cortex exhibits to our observation, and according to which it may be intelligently analyzed, are not, then, uniformities of organic process or muscular contraction. They are uniformities of *behavior* in a larger sense.

In the light of this conception let us turn to the examination of some of the simpler typical mental phenomena and their bodily correlates. We shall consider first the case of emotion, using *fear* as an example.

Research has so far failed to localize this and other emotions in the cortex or in the lower centers. Yet fear, like other primary emotions, has markedly characteristic bodily expressions. It manifests itself, in fact, in a variety of ways: in flight, in hiding, in shrinking, sometimes in "freezing," or a complete paralysis of all activity, even vocal utterance. Sometimes it impels the individual to seek the protection of some other individual, as the child flees to its mother's skirts; or, again, it inspires to frantic attacks on the inciting objects. All these characteristic responses are found in man; and to these we may add the "expressive" reactions—such physiological disturbances as pallor, trembling, increased heart-beat, excitation of the ductless glands, *etc.* If we include the species we find even greater variety of congenital and acquired responses. Now what is the common denominator of these varied modes of behavior? There must be considerable diversity in nervous activity to issue in such diversity of response. For not only are the characteristic responses different on different occasions; the stimuli which inspire fear congenitally, and as a result of simple experience, differ at least as widely. These widely differing stimuli, and the widely differing responses to which they lead, must be connected by a great diversity of central stimulation. Although various theories have been advanced, we can point to no cortical or sub-cortical "center" of fear, nor to any characteristic set of paths followed by the excitations set up by stimuli responded to as "fearful." And while recent researches have shown that an important part is played in emotional disturbance by the activity of the ductless glands, they have failed to discover in such physiological activity any specific correlate to a specific emotion. Yet these varied modes of response and the differing cortical action leading to them mediate a common experience—fear. What the various stimuli have in common is no set of similar physical characteristics. It is the *common relation* in which they all stand to the individual, the relation of being *dangerous*. Similarly the varied responses fall into a single group because of their common function in averting the threatened danger. The response

actually elicited on any particular occasion may, it is true, fail to avert the danger, but the normal function of such behavior remains the same. The variety of fear responses exhibited by a species are undoubtedly evolutionary modifications of much simpler reactions, possibly even the primitive avoiding reaction. But the modifications of reaction which have been selected in the race, as in the individual, have been selected and preserved because of their success in performing this function, just as the stimuli which evoke it are selected because of their dangerousness. Consequently we find civilized man not only persisting in the congenital and simpler types of reaction to danger, but acting in indefinitely varied and indirect modes as well.

It is their common ancestry and the community of function in the economy of life which serves to unite the varied responses into a single phenomenon. So, too, it is the identity of the part played in this economy by the differing cortical and sub-cortical processes exciting these responses that determines the identity of the correlated conscious experience. Even if research should discover a "fear center" to which all "fearful" stimuli are transmitted and whence all fear responses are indirectly excited, the case would not be essentially altered, for we should point to the stimulation of this center as the correlate of the emotion fear precisely because of its function in coordinating such responses to such stimuli.

We are now prepared to consider the case of perception. This is more complicated than emotion since perception covers so wide a range of phenomena, and since meaning is so largely involved. Thus we may *perceive* a total situation, a single object, a relation, or a quality. But in none of these cases, except possibly the last, have we grounds for supposing that "sameness" of perception is conditioned by sameness of physiological process. My perceptions of my dog on different occasions, since they are perceptions of this same familiar dog, are in so far alike. But the sensory excitations from eye and ear and hand, if compared on any two occasions, would probably be found to contain no single common factor, nor is there evident reason to suppose that the perception of my dog excites any invariable motor response. Perceptual experiences are commonly classed as like or different because of identity of meaning, rather than because of likeness of sensory content, and, as is well known, physiological psychology ventures to say very little concerning the physiological basis of meaning.

When we come to perception of simple sense-qualities, such as color, tone, odor, *etc.*, however, the case is very different. Such experiences seem to be classed, both by common sense and psychology,

wholly on the basis of immediately felt identities and differences, without any reference to meaning. And it is these psychological phenomena to which definitely localized cortical excitations correspond. Thus there is a well-defined visual center in the occipital lobe, *etc.* In short, perception of sense qualities is the field where the evidence for psycho-physiological, if not psycho-physical correlation is most convincing. In the phenomena of vision, in particular, research has established beyond dispute that specific physiological structures condition the experiencing of the different visual qualities. Various color theories, it is true, continue to dispute the field, but all unite in the unquestioned assumption that the experience of color qualities is mediated by the functioning of correspondingly different physiological structures. Take the case of "red," for example. Here, as in the case of other visual and auditory qualities as well, we find a definite physical correlate of the sense quality "red," *viz.*, specific wave-length. In order that a physical stimulus of this sort should excite the corresponding sensory quality, it must initiate a specific process in retinal end-organ, which must in turn set up processes in the cortical cells of the visual center. Now, according to the traditional view, the excitement of such specific processes in the visual center is the essential and sufficient condition for the experiencing of the quality "red." What we have to ask is whether this view adequately represents the relevant empirical facts, or whether it is a result of the same theoretical preconceptions which dominated the thought of Tyndall's generation. That the excitation of specific processes in the visual center is a necessary condition of experiencing "red," is, of course, to be admitted; but that such excitation constitutes the *essential* and *sufficient* condition is not, I submit, a conclusion warranted by empirical evidence, nor is it a conclusion which any available empirical evidence could suffice to establish. For what sort of empirical evidence is adducible? The evidence from behavior only. That an individual is or is not capable of experiencing a given sense quality can be determined only by his capacity to discriminate the quality by appropriate behavior. It is only on the basis of evidence from behavior that any conclusions as to the cerebral function can be drawn. Now the ability to discriminate a sense quality like red depends not simply upon the excitation of specific processes in the sensory center, but upon the existence of an extensive system of sensory and motor connections. For such a system of connections is implied in the very act of attention itself by which the quality is perceived. Consequently, what the empirical evidence points to as the neural correlate of the sensation "red," is not the occurrence of specific processes in the visual center, but the

functioning of that center as a member of a complicated system. To suppose that excitation of the visual cells could mediate the experience of sense quality red if their functional connections with other centers were interrupted, is to make an assumption for which no possible evidence is available and which must rank accordingly as futile speculation.

Let us turn to the consideration of the psychological correlates. It is often urged that the analysis and description of mental phenomena must be carried out in the last resort on the basis of introspection. "Fear" is something I first became acquainted with in my own experience, and afterwards learn to associate with its external manifestations. Red is a felt quality, knowable only in its immediacy. So all our feelings and sensations, if not our thoughts and beliefs, are something immediately and directly experienced, something whose intrinsic qualities are the private possession of each of us. I may, indeed, on the strength of the dubious argument from analogy, attribute to my fellow-beings the enjoyment of inner experiences like to mine. But all that is open to my observation is his like behavior. It *may* be true, since the argument from analogy falls so far short of proof, that your feeling of fear is more like my sadness, or my anger, than it is like the fear I feel, or it may be something altogether akin to my experience. This hidden feeling of yours, unknowable by me, is like mine, indeed, in that it leads you to actions such as mine excites in me, but this likeness is merely one of external relationships. Or, again, although we both agree in calling blood red, and finding it in this respect like strawberries or the alternate stripes on the American flag, and although we both place it similarly on the color pyramid, and agree in calling it warm and the color of passion, *etc.*, it may be that what you enjoy as "red" I enjoy as "blue," and that only in their relations are our two reds identical. Indeed, we may go further and suppose that the whole course of your experience as immediately enjoyed by you is utterly different in felt quality from mine. Such a supposition can not be refuted—nor can it be established—for the simple reason that it is beyond the reach of any argument whatsoever. It is an essentially unintelligible supposition concerning wholly unknowable things-in-themselves.

Mental phenomena, like any other phenomena, can be subjects of intelligent discourse only in so far as they are identified and described in significant terms. In what terms then can mental phenomena be significantly and intelligibly described and analyzed? If the examples which we have chosen from the fields of emotion and perception are typical, it is only by reference, direct or indirect, to

their function in securing the adjustment of the individual to his environment, physical and social. The fear which the psychologist studies is not a hidden feeling cherished within his breast; it is precisely *that* feeling which is inspired by determinate objective conditions, and which impels him to characteristic expressions and acts. He can identify a given experience to himself as "fear" only in so far as it sends cold shivers down his back, or gives him a sinking in the pit of his stomach or makes his knees shake beneath him. But even these private earmarks are phrases whose significance is set by common usage.

If the foregoing contentions are just, the conclusion we have to draw is that the mental and bodily phenomena whose empirical correlation sets us our problem are not phenomena belonging to two distinct orders of nature, but phenomena which actually are, and only can be, individuated and classified by common principles. Both the bodily correlates of mental processes, and the mental processes themselves, are individuated as phenomena only on the basis of their function in adjusting the individual to his environment.

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THE DIVISION OF JUDGMENTS

I

JUDGMENTS in logic are traditionally divided on the four bases of quantity, quality, relation, and modality, and this division has received so much support from the influence of Kant that it has persisted in our elementary manuals down to the present day. And yet, the whole movement of what is known as "modern logic" has been definitely in another direction. Lotze, for instance, rejects at least three fourths of the traditional scheme. He insists that judgment is an interpretation of observed fact, expressing not merely a relation between the matters of two ideas, but also the ground of this relation, and shows that this relation and its ground are expressed by means of the copula. It follows that judgments can be divided into as many different forms as there are different meanings of the copula—*i. e.*, different accessory notions which we form of the connection of *S* and *P*. Of such accessory notions we form three main types: (1) the categorical, which connects *S* and *P* on the model of the relation of a thing to its property, (2) the hypothetical, which connects *S* and *P* on the assumption that a certain condition is fulfilled, and (3) the disjunctive, which imposes upon *S* the necessity

of choosing between several mutually exclusive *P*'s. The attempt to express the ground is inadequate in the categorical form, more adequate in the hypothetical form, and most adequate in the disjunctive form, which, by its reference to a system within which choice is logically determined, points to the ideal ground of complete coherence. Lotze thus recognizes three essentially different forms of judgment, which correspond to the group known traditionally as the relation-group.[1]

For Sigwart, on the other hand, there are no essentially different forms of judgment. Any diversity supposed to attach to such forms is at best diversity of matter, the matters of the two ideas *S* and *P*. At its worst, such supposed diversity is diversity of verbal expression in the propositional forms of judgment. We must guard against thinking that the name "judgment" denotes a number of originally different and coordinate acts of thought. All judgments as such are, in fact, formed by one and the same mode of thought-activity, and thus we can recognize only one sort of judgment, the categorical statement that a predicate belongs to a subject.

For Bradley, also, the traditional forms of judgment are not essentially different. All judgments are assertoric or categorical, all are hypothetical, all are particular, all are universal, all are abstract and concrete, analytic and synthetic. There is only one form of judgment, the referring the ground of *SrP* to Reality—a reality with which we are in contact in sensory experience.[2]

Bosanquet, while insisting, like Bradley, that all judgments are categorical, hypothetical, universal, individual, positive, negative, abstract, and concrete, is yet especially interested in tracing the various forms of judgment which arise in the evolution of thought. Judgment, as the effort of thought to define reality, varies, as Lotze has pointed out, with the degree of success with which it defines. But it also varies, as Sigwart has insisted, with the kinds of reality to be defined. For instance, an equation, a definition, an esthetic appreciation, are all judgments. They differ with the difference of

[1] Quantity, quality, and modality, are rejected as failing to touch the essence of judgment, *viz.*, the relation and its ground expressed in the copula. The relation *SrP* remains unchanged whether we speak of one *S*, two *S*, or *nS*, whether we affirm or deny it, and whatever the degree of assertiveness with which we affirm or deny it. The influence of this view is strongly marked in the case, *e. g.*, of Hibben's *Logic*.

[2] We might further compare what Bradley says *re* the impossibility of having fixed models for reasoning; for the argument applies also to judgment. There are principles which test the general possibility of making a construction; but of the actual construction there can be no canons. We should need an infinitude of *schemata* to parallel the infinitude of possible relations between *S* and *P*. (*Princ. of Logic*, pp. 238–239, 246, 248.)

the totalities which they respectively analyze. They are divergent developments of the same relation, and the divergence is shown in the predominance in each of some special aspect which is present but subordinate in the other forms. In this way intelligence, in spite of its unity, is many-sided; and its aspects, which are correlatives, lose their true interdependence if we try to represent them in a single (linear) series, as is done, for instance, by Plato. Bosanquet accordingly gives us an elaborate division of judgments in a number of series: (1) rudimentary or intermediate series, (2) concrete or categorical series, (3) abstract or hypothetical series, *etc.* The species thus established are regarded as cross-sections through the self-evolution of thought, ways in which our concrete attempts to define reality by significant ideas have become crystallized, somewhat as the species-definitions in botany represent crystallized cross-sections of our ever-changing, evolving knowledge of plants. The scheme is not intended as a Procrustean bed for the facts of logic, but as a practical arrangement which shall assist the reader in understanding the judging process.[3]

According to Wundt, our logical thought is not immanent in the objects themselves; it is merely an instrument for investigating and discovering objective relations. From the view-point of logic, then, judgment consists in the analysis or articulation of a thought into its two main elements, *S* and *P*, and, as thus analyzed, judgment has three main kinds, according as we find differences, (1) in the *S*-concept, (2) in the *P*-concept, (3) in the relation of *S* and *P*. He therefore divides judgments as follows:

I. Subject-forms of judgment. This class includes (*a*) indeterminate judgments, (*b*) singular judgments, (*c*) plural judgments.

II. Predicate-forms of judgment. This class includes (*a*) narrative, (*b*) descriptive, and (*c*) explanatory judgments.

III. Relation-forms of judgment. This, the most important class, includes (*a*) judgments of identity, (*b*) judgments of supra- or infra-ordination, (*c*) judgments of coordination or dependence.

IV. Validity-forms of judgment. This class includes (*a*) negative, (*b*) problematic, and (*c*) apodictic judgments.[4]

[3] A simplification of Bosanquet's view, betraying also the influence of Bradley, is given by Creighton, who divides judgments into (1) qualitative, (2) quantitative, (3) causal, (4) individual, or judgments of individuality.

[4] The validity-group is not intended by Wundt to be coordinate with the other groups. It includes important sub-forms which belong to all three other groups—negative judgments, for instance, are found in all three classes. (*Logik*, 3e Aufl., I., pp. 165 *ff.*)

For Erdmann, on the other hand, our logical thought *is* immanent in the objects themselves, and judgment is the attempt to formulate in terms of the predicative relation objective relations in the real world. There is, however, no single principle for dividing the different types of judgment as such, and in order to be just to the empirical facts, Erdmann divides judgments into the following groups:

I. Simple judgments.

(*a*) Judgments which express "real" relations. This group includes (1) formal, (2) attributive, (3) causal judgments.

(*b*) Judgments which express "ideal" relations. This group includes (1) judgments about grammatical relations, (2) judgments of similarity, (3) normative and value judgments.

From another view-point, simple judgments are divided into:

(*c*) Content-judgments. These are either (1) individual, or (2) general.

(*d*) Extent-judgments. These are either (1) particular, or (2) universal.

Finally, the syncopated forms of judgment, such as the "impersonals," are regarded as a class of simple judgments.

II. Complex judgments.

(*a*) Combinations of judgments. This group includes (1) copulative, (2) conjunctive, (3) divisive judgments.

(*b*) Judgments about judgments (*Beurteilungen*). This group includes (1) negative, and (2) modal judgments.

(*c*) More complex forms. This group includes (1) hypothetical, and (2) disjunctive judgments.

Finally, perhaps we may mention what we find in the logic of the pragmatist school. For this school judgment is instrumental. Its function is to construct, justify, and refine experience into exact instruments for the direction and control of future experiences through action. There are all grades of development from the crudest to the most expert forms. Three typical stages seem to be recognized: (1) impersonal, (2) reflective, (3) intuitive. By the intuitive stage of thought is meant the unhesitating efficiency which results in complete control of action, an efficiency arising within a certain sphere of action through constant, intelligent use and practise.[5]

[5] See esp. S. F. McLennan, *Typical Stages in the Development of Judgment*, in Dewey's *Studies in Logical Theory*. Also Dewey, *Experimental Logic*, Ch. VI. A somewhat similar general attitude is taken by the "personal idealist," Henry Sturt, in *Principles of Understanding*.

II

If the preceding instances may be regarded as representative, we can state that in modern logic, so far as concerns the division of judgments, three main tendencies are present. In the first place we have the view that judgment is one and one only, and as such excludes the conception of essentially different forms or types. Affirmative and negative, categorical and hypothetical, represent variations of emphasis merely, different aspects of one and the same fact, *viz.*, that judgment is a systematic totality. For this view, no logical division of judgments is possible, and indeed, in the end, there seems to be only one judgment.

In the second place, while equally insisting upon the unity of judgment, considered from this ideal view-point, many writers accept a quasi-Hegelian view of the self-evolution of logical thought, and distinguish, in the process which leads from the primitive, superficial grasp of externals to the final profound apprehension of the systematic totality of the real—or at least of the thinkable—a number of *stages* rather than coordinate forms. As a rule, no insistence is made upon the exact number of stages to be accepted by logicians. It appears to be a matter of convenience, and the aim is merely to indicate in a concrete way the progressive nature of thought in its evolution, and the rich variety of its products.[6]

In the third place we have the view of writers like Erdmann, writers who regard judgment as the (predicative) apprehension of what is logically immanent in the relations of real objects, and while on the one hand insisting that there is no single principle in the nature of judgment as such which could serve as a *fundamentum divisionis*, in practise divide judgments on the basis of the differences of objective relations. Thus, a judgment about mathematical relations belongs to a different class from judgments modeled on the relation of a thing to one of its qualities, or from judgments which move within the system of inter-relations which constitutes grammar. In fact, it is less a division of judgments than a division of objects.

Our only possible conclusion is that modern logic recognizes no logical division of judgments into coordinate types or species. Logically, judgment is one and indivisible, and we can regard this question as settled. The only question which remains to be solved is how to deal with the mass of diverse-appearing material in a manner which shall be at the same time convenient and just. Hitherto two

[6] So Bosanquet and Creighton. Lotze, however, regards the categorical, hypothetical, and disjunctive forms as "essentially different" (*Logik*, pp. 38, 41). Boyce Gibson accepts these forms, but reverses the order of the last two (*Problem of Logic*, pp. 111–112).

solutions have been proposed. The first consists in recognizing a number of stages in the self-evolution of thought. The second consists in recognizing differences in the objects about which we judge. Does either of these suggestions possess superiority over the other?

Let us consider. In the literature, no writer attempts to base his distinctions *solely* upon objective differences. Bosanquet and Creighton, for instance, deal with judgments of quality, *i. e.*, apprehension of mathematical relations, with apprehension of causal relations, and finally of the systematic inter-relation of parts within a whole which Creighton calls judgments of individuality. The relations are "objective," but the arrangement of them in "series" is based upon the distinction between superficial and profound. The qualitative aspect which is open to sense-perception does not go so deeply into the nature of the object as the mathematical intelligence which grasps quantitative relations. Causal relations go still deeper, and when we apprehend the object from the view-point of the whole, as one element in an organized totality, we have gone as far as is possible.[7] So too the pragmatist arranges the forms of judgment recognized by him into stages from the more crude to the more efficient, and even Erdmann, who more than any other writer insists upon the objective nature of the relations which he recognizes, arranges judgments in an order from the simpler to the more complex. We must, however, admit that Erdmann dissociates himself from those who arrange judgments according to stages of progressive insight. On the whole, then, if we consider the nature of the case as well as its treatment in the literature, we must realize that relations between objects are at least as numerous and incalculable as the objects themselves, and that consequently, as a basis for dividing up the field of concrete judgments, the method of recognizing "stages," whether of insight or efficiency, is preferable, at least from the standpoint of convenience.

Let us examine this distinction a little more closely. It is not a logical distinction, based on "specific differences within the essence" of judgment. As we have seen, modern logic repudiates such a conception. If the distinction is not logical, what *is* it? It deals with the process-side of knowledge. On what does this process depend? A process always involves two factors, and it is their mixture in varying proportions which results in the various stages of the thought-evolution. What, then, are these two factors? What is the factor whose predominance makes the judgment crude or superficial?

[7] So too Lotze, Hibben, Boyce Gibson, *etc.* On the subject of "individuality," which corresponds to some extent with what Lotze and Bosanquet regard as the field of disjunctive judgment, *cf.* also Bradley, *Princ. of Logic,* pp. 447 (§ 26), pp. 449–451 (§§ 29–30).

What is the other factor, whose predominance makes the judgment efficient or profound? Under various disguises, the two factors turn out to be sense and intellect, and the basis of distinction is psychological, as indeed we might expect in dealing with the process-side of knowledge.[8] The judgment of quality is, in psychological language, the judgment of perception, and all the other types recognized in modern logic are judgments which, while still retaining some thread of connection with sense-perception, are transformed into something more "profound" by the degree to which the intellectual standards of identity, difference, and systematic organization are brought to bear in clearing up their content. The final case—what Creighton calls "judgments of individuality"—can hardly, perhaps, be realized. For there is always a gap between what sense can give and what our uncompromising intellectual standards demand. But in one form or another, approximations to such judgments represent a perpetual recurring human demand, and thus deserve to be recognized in logic.

So far, then, our conclusion is, that judgments can not be divided upon a logical, but only upon a psychological basis. It remains to ask, how this psychological distinction of "stages" should be worked out in detail. Hitherto we have considered only a dualistic attempt to combine two bases, (1) the psychological, and (2) some objective classification of real relations. But this is to introduce all the difficulties of dualism and heterogeneity, and it commends itself to recognize frankly the psychological nature of our method. If it is possible, if such a division can be carried through, two questions only can be asked: (1) Is it convenient? (2) Is it just to the empirical facts? That it is possible is explicitly recognized by Erdmann, who furnishes us with a somewhat elaborate specimen of the way in which it can be done. He insists that his treatment is just to all the empirical facts, for there is not a single judgment of the group which he regards as "logically" divided but can find a place somewhere in the psychological scheme,[9] but it remains a question, how far his

[8] *Cf. e. g.*, Bradley, *op. cit.*, pp. 440 *ff.* The "psychological" basis belongs, as Erdmann points out, to a psychology *durch logische Gesichtspunkte normirt.*

[9] The scheme is: I. Analytic judgments. (*a*) Original (judgments of perception, direct judgments of experience, symbolic judgments of experience). (*b*) Derivative (memory judgments, imagination-judgments, abstract judgments). II. Constructive judgments. (*a*) Judgments communicated to us by others, through language. (b) Judgments thought out by us for ourselves. After the work of Bradley and Bosanquet in showing that analysis and synthesis are two sides of the same process, it does not seem possible to maintain Erdmann's distinction of the two great classes. And, in any case, the distinction between II. (*a*) and II. (*b*), however useful for immediately practical purposes,

scheme is convenient. In fact, just as, in the attempts to work out the dualistic division, Creighton's version is undeniably more convenient than Bosanquet's, so our problem here seems to be to construct a scheme which shall be more convenient than Erdmann's, while retaining what is essential in its view-point.

III

To this end I would suggest the following division of the field of judgment, on the basis of the comparative predominance of sensory and intellectual elements:

Stage I. Judgments of perception. Examples: It is warm. This paper is white. This tree is higher than that.[10]

Stage II. Judgments of experience. Examples: Children are a joy. Everywhere you see grain elevators. A thick rug under the feet prevents chilblains. The freight-trains are growing more troublesome every year.[11]

Stage III. Symbolic judgments. Examples: Socrates was put to death for political reasons. Sea-sickness depends upon the functioning of the semi-circular canals. Not more than one man in a thousand would vote for that programme. $x^2 - y^2 = (x + y)(x - y)$.[12]

Stage IV. Transcendent judgments. Examples: The prince now possessed the magic sword, the cap of darkness, and the seven-league boots. Oh! for a mansion in the skies! I am the master of my fate, I am the captain of my soul. Life *means* more life, life without end or limit—immortality. Time and space are unreal, mere forms of sensibility, which disguise the real. Things-in-themselves are knowable (or unknowable).

A brief explanation of the above distinctions is perhaps necessary. A judgment of experience differs from the perceptual judgment, in that it depends more on memory or previous perceptions than on direct present perception. It is more complex, and sums up many previous experiences, as a composite photograph gives us the

hardly commends itself to strict theory. Wundt seems to object in principle to the psychological analysis of judgments (*Logik*, 3e Aufl., I., p. 74).

[10] Judgments of perception correspond to Erdmann's judgments of perception and the qualitative judgments recognized by Bosanquet and Creighton.

[11] Judgments of experience correspond to Erdmann's judgments of direct experience. In the case of both perceptual and experiential judgments, however, Erdmann's distinction between analytic and constructive is dropped.

[12] This corresponds partly to Erdmann's symbolic judgments of experience, but includes also what he calls judgments of imagination and abstract judgments, in part. The other part of Erdmann's class of abstract judgments is included in our class of transcendent judgments.

result of many direct likenesses of actual persons. It looks before and after, and loosens our thought slightly from its sensory moorings. But the distinction is a matter of more or less only. Where the sensory element of direct perception predominates, we have the perceptual judgment. Where the intellectual element of summing up many experiences predominates, we have the judgment of experience.

The symbolic judgment differs from the judgment of experience in that it extends our knowledge beyond the field of actual experience. It constructs, on the analogy of experiential types, new objects of similar type, objects which we might possibly experience (or have experienced), but which we have in fact not actually experienced. Our knowledge of Socrates is indirect, a highly intellectual construction which extends far beyond the field of actual sense-experience. Most of our forecastings of the future and all of our scientific laws belong to this group. They are formed by the introduction, into the sensory consciousness, of intellectual standards which enable us to construct systems valid, not merely for actual experience (which is past), but for possible human experience. It is unnecessary to point out, perhaps, that the transition between experiential and symbolic judgments is gradual.

The transcendent judgment is an attempt to extend the field of symbolic judgment beyond the limits of human experience, actual or possible. In the symbolic judgment, our object is always something which might conceivably be experienced (or have been experienced). But in the transcendent judgment, the object could never be experienced. Such judgments are both natural and common. Consider, for example, the ever-recurring interest in mysticism, the medieval search for the philosopher's stone, the inventor's fascination in the case of perpetual motion, the still not uncommon belief that one can read destiny by the lines in the palm, if not by the conjunctions of the heavenly bodies. So too in every walk of life, the human yearning after some ineffable ideal, some unspeakable perfection—the "vision" (as we call it) of ideal truth, power, love, or happiness—leads us insensibly and inevitably beyond the narrow confines of possible experience.

The above types exhaust the field of human thought. They represent four stages of judgment, distinguished from one another only relatively, according as the perceptual or the intellectual element predominates. The simplest judgments of perception exemplify, to *some* extent, the operation of the elaborative, idealizing tendency of intellect; and the most transcendent judgments we can make, the finest thought-webs we can spin, are still attached to earth by *some*

sensory threads, gilded o'er by the warmth of personal feeling and personal sense-experience. A pure intellect and a pure sensation are equally beyond our human thought. All our thinking moves within these two extremes, and partakes of both principles in varying proportions.[13]

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[*Note:* The following list of references is not intended to be exhaustive; nor does it claim for all the references first-rate importance or equal value. It has been made up by fusing the separate lists contributed by the several leaders. Hence it may perhaps be said of every item that at least one of the leaders has had it in mind in mak-

[13] This fourfold division of the field of thought into "stages" is not entirely novel. It corresponds, roughly, to Plato's four stages of intelligence. (*Republic,* vi, pp. 509 ff.) Bosanquet explicitly objects to this mode of division, as being too simple for the empirical facts. For Plato intends it not merely as a psychological division, but also as a division of objects. But we have rejected the attempt to classify objective relations, and advocate the distinction of stages purely on a psychological basis, as (1) convenient, and (2) sufficiently inclusive to be just to the empirical facts.

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REVIEWS AND ABSTRACTS OF LITERATURE

Problems of the Self. JOHN LAIRD. London: Macmillan and Co., Ltd. 1917. Pp. xii + 375.

In a recent number of the *Unpopular Review* there is a criticism, well supported by quotation, and for the most part well deserved, on the obscurity, the wilful obscurity of philosophers. There are, however, some of the old masters who belie this report, and occasionally our contemporaries deign to express themselves in language that can be understood. One example of this greatly desired trait is Professor Laird's *Problems of the Self*. Indeed, so clearly and comprehensibly is it written that, barring one or two chapters, it could be read with interest even by those guiltless of technical philosophical study. Part of this clearness is due to a careful discrimination and explanation of terms. There is detailed analysis of the different senses in which important words have been used, and clear statement of the sense in which the author intends to use them. Another characteristic which makes the book a pleasure to read is its constant use of summary and forecast, the statement of the point reached in the argument, together with the line to be followed in its further development.

Professor Laird's theme lies in the question, "What is the Self?"

It is a question badly in need of asking and of full and free discussion. Convictions, opinions and prejudices, openly expressed or lurking as tacit presuppositions in our philosophical literature, are of the greatest variety, ranging from the denial that the self is anything more than a verbal abstraction to the assertion that it is the only reality, eternal, unchangeable, and frequently unknowable. The whole subject has long been greatly in need of the thorough overhauling that is here given it, and if there are more questions raised than answered, this but justifies the title of the book.

In all questions concerning the self, Professor Laird takes his stand firmly on introspection as the only unchallengeable authority. Whether the self prove eventually to be more, or less, than experience, its study must start with an analysis of experience as it is found. The first problem is, therefore, "to consider, as precisely as possible, what experiences are, and then to discuss their relation to, or their union in, the self."[1] In accepting the traditional division of consciousness into "cognition, endeavor, and feeling," Professor Laird provides a careful analysis of what is covered by each of these terms. In no case must experience be understood to include the objects of experience. In common with many other modern realists, Professor Laird emphasizes strongly the distinction between the act of being aware and the object of the awareness. The act is a part of consciousness, but the object is a "presentation," which is neither mental nor physical. The argument seems based on the apparent absurdity of saying that the mind, when viewing, for instance, an old cathedral, is gray and stony. But is this not, after all, a merely verbal *impasse?* Is it not simpler and closer to introspection to say that what is found in perception is not the conscious act plus a presentation, which is produced somehow by the cooperation of the mind and the physical object, but rather a direct relation between subject and object, the self modified in certain definite ways in response to an outside stimulus?

This distinction between act and object is, however, necessary, if cognition is to be brought into line with endeavor and feeling defined as acts of reference to an object. "The primary and fundamental characteristic of a conscious experience is its reference to an object. This, I think, is the only common characteristic of that which is psychical."[2] This definition of consciousness is still open to question, even after Professor Laird's detailed argument in its favor. It does not sufficiently differentiate conscious facts from some that are not usually considered such. Magnetic attraction, for example, might easily be defined as motion in reference to an object,

[1] P. 14.
[2] P. 33.

and the tropisms of plants are essentially acts of reference to the stimuli. This definition also results in rather unsatisfactory descriptions of some psychical facts, perception as has been suggested, and physical pain in particular. The act of feeling the pain must be considered as something different from the pain felt. The latter, the presentation, standing midway between the cause, which is physical, and the feeling, which is psychical, is itself neither fish, flesh, nor good red herring.

The analysis of experience shows that it is composed of these various acts of reference, not existing separately or independently, but "fused and blended together." It is this mass, of feeling, will, and cognition, of present, past, and future, of clear consciousness, marginal consciousness, and subconsciousness, which makes up the self. "Detached experiences, if they exist, are not a self. To be parts of a self they must conspire together with other experiences to form an individual, continuous unity."[3] Professor Laird shows convincingly that the self is not primarily willing or feeling or knowing, but is essentially a whole, of which these phases are convenient but superficial abstractions. The main problem, then, is to discover the underlying principle of this unity. It is necessary, however, to guard against exaggerating the degree of unity and continuity found in normal selves. There is unity, but there is also discord and self-contradiction; there is continuity, in memory, in habits and dispositions, but there is also forgetfulness, and sometimes abrupt change in character. The precise degree of unity and continuity essential to a self tends to become a matter of definition. There would seem to be groups of loosely organized experiences below the grade of selfhood; and self, again, is a wider term than personality which implies purpose and responsibility.

If Professor Laird's conclusion, his solution of the problem, is the least persuasive part of his book, this is, perhaps, not surprising. Solutions have a way of satisfying only their fashioners. The explanation of the nature of soul or self begins with its traditional definition as an immaterial substance, existing in time. "Immaterial" is rejected as a purely negative characteristic, "existing in time" assumes the reality of time which is not here under discussion. This leaves us with "substance" alone as the definition of soul, and the meaning of substance must be ascertained. After a discussion of other senses in which it is used, substance is interpreted as "existent reality." Reality, which means objectivity, "controlling or limiting thought," is a much wider term than existence. According to Professor Laird, existence refers to those realities of which we have evidence through the senses. This definition, though frankly

[3] P. 213.

elevating chimeras, centaurs and the phantoms of our dreams to the rank of existent realities, might be accepted if it could bring order into the generally chaotic conceptions of existence and reality. But, as Professor Laird admits, it is not a great help in the argument, since it is practically supplanted by the conception of the "particular." This means, first, not a universal, second, having a specific unity of its qualities, which constitutes its form, and, third, including matter, "stuff," as well as form. In the case of physical things this matter, or "raw material," is dependent for definition on the point of view. Iron, which is substance from one standpoint, is matter from another.[4] The matter of which the soul or self is composed is experience. "The fact that there are selves is the fact that every experience forms part, and must form part, of an individual, specific, particular unity."[5] This unity, however, must not be interpreted too literally. The unity of a certain definite train of thought or action is much more close and meaningful than that of the self of which it is a part. The experiences are substances which exist as part of the other substance, the self. "The existence of all of them in a unity through time (though perhaps with intervals) *is* the soul, the psychical substance."

It is difficult to see how, except in form, this conception differs from that of the "psychology without a soul," which Professor Laird apparently rejects. It does not differentiate between a self and a single experience, or between a self and a society of selves, except by the difference in the amount of material organized. Even the most radical critic of the conception of self would admit that there is a certain degree of unity in one person's experience. The argument against considering the body as part of the self by no means disproves the possibility that the body or the nervous system might be the basis of this unity. He offers no alternative unifying principle beyond the fact that the unity exists.

Perhaps the most characteristic, and certainly one of the most interesting, features of ***Problems of the Self*** is its large-minded tolerance of unsettled issues. This results in frequent suggestion of interesting bypaths for research or argument. The discussion of multiple personality is brief but clear and pertinent.[6] The possibility that the same experience may be shared by different selves; that the soul might have an intermittent rather than absolutely continuous existence; the criticism of monistic idealism on the ground that the more inclusive unity is also the less organized and less meaningful; the relation between identity and change: all are touched upon more or less lightly, but suggestively and without prejudgment.[7] There is

[4] P. 347.
[5] P. 366.
[6] Chap. 11.

little dogmatism and no narrow prejudice, but an evident willingness to consider all ideas and theories on their own ground.

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Epistemology. P. COFFEY. London: Longmans, Green and Co. 1917. Vol. I., pp. xiv + 374. Vol. II., pp. viii + 376.

This book is an excellent example of the sort of work being done at Maynooth, Stonyhurst, and Louvain by the reviewers of scholasticism. It is dedicated to Cardinal Mercier and, in spite of slight divergences, is typical of the standpoint of the school of which he was the patron. In other words, it represents Thomism or moderate realism, a view encouraged by Leo XIII.

After carefully reading the present volumes, the reviewer must admit that he has been impressed by the wealth of reading implied by the topics examined and the references given. While not competent to judge the adequacy of the treatment of the Catholic literature on epistemology, he sees reason to hold that the author is completely at home in Neo-scholasticism. Moreover, Dr. Coffey has not neglected modern movements, although his references are seldom to periodical literature. He has evidently been impressed by Prichard's excellent work on Kant, with which he seems largely to agree. I can not help feeling that it is a good sign when a manual of this kind refers to James, Schiller, Wundt, Peirce, Dewey, Bergson and others of their kind. But the standpoint is frankly that of Aristotelian Scholasticism.

The contents of the first volume can be indicated only very briefly. In the Introduction he maintains that epistemology is really a part of metaphysics. Its function is to complete and consolidate metaphysics. The remaining chapters concern themselves with such enquiries as these: The Terms and Data of Epistemology, Its Scope and Instruments, Necessary Judgments, Moderate Realism, Extreme Realism, Nominalism, Conceptualism. It is to be noticed that he pays more attention to Kant than to any other modern thinker "because most of the modern theories draw their inspiration directly or indirectly from principles propounded in the *Critiques.*"

What will strike the American reader, used to a brief manual, is the leisurely way in which all conceivably relevant topics are taken up and discussed *pro* and *con.* In many of these discussions there is evidenced good analytic ability and balance of mind. Thus, we have carefully worked out distinctions between irresistible certitude and freely formed convictions; between truth, error, and ignorance; between doubt, opinion, conviction, certitude, belief, and faith. Still

[7] P. 362. Chap. 10, p. 365.

there is prolixity in much of this which would irk most readers. The atmosphere of the seminary lingers around it.

The definition of epistemological terms has been carried out very successfully. I have found the scholastic terminology well adapted for essential distinctions. Thus, such expressions as *"esse ideale," "esse intentionale"* and *"medium quo, in quo, per quod res cognoscitur"* are valuable. In harmony with this tradition of exactitude is the care with which various positions are named and classified. Berkeley's philosophy is described as acosmic or hyperphysical idealism; Hume's as pan-phenomenism, *etc.*

I am inclined to think that readers will find Chapters IX., X., and XI. the most interesting in this volume. The difference between modern and medieval nominalism is well brought out.

Volume II. falls into two parts, dealing with the problem of our knowledge of the external world, and with the criteria of truth, respectively. It is interesting to note that Jeanniére defends mediate sense perception while Coffey argues for perceptionism. It would seem that, while scholasticism is consistently realistic, it is divided into these two camps. I must confess that I have more sympathy with mediatism. The *parti pris* of the writer comes to the surface in his treatment of evolutionary relativism.

This book is a scholarly piece of work and gives one a high opinion of the training given in the better Catholic seminaries. Yet one is constantly aware of the anti-naturalistic assumptions within which it is developed. It is practically taken for granted that intellectual capacities can have no evolutionary origin. But, until the mind-body problem is satisfactorily solved by modern science and philosophy, the naturalist can only point out his divergence.

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NOTES AND NEWS

To the Editors of the Journal of Philosophy:

I HAVE read with much interest Dr. Bode's *Consciousness as Behavior,*[1] in which he refers to certain parts of my article on *Behavior* previously published.[2] I find myself in the main in agreement with Dr. Bode's remarks in regard to interpretation. I may note, however, that if a lover were to limit his consideration of James's "automatic sweetheart" to an objective view, as he should properly do if he were a behaviorist, I fear he would find it difficult to accommodate his acts to hers. His knowledge of the workings of the complex organic system under observation is altogether inadequate to point the way to such accommodations.

If, however, he assumes that all special changes in her behavior correspond with equally special changes in her consciousness; then the discovery, by indirect interpretation, of certain changes in her consciousness may enable him to make accommodative changes in his own consciousness which will correspond with accommodative future acts of his own.

This, however, is apart from the point I had hoped to make clear. I may put it in the form of a question. Does Dr. Bode hold, or does he not hold, that "Consciousness . . . *is* just a future adaptation that has been set to work to bring about its own realization"?[3] It

[1] This JOURNAL, Vol. XV., p. 449.

[2] This JOURNAL, Vol. XV., p. 258.

[3] *Cf. Creative Intelligence,* p. 244. Italics mine.

may be possible to maintain that consciousness corresponds with a future adaptation of this nature; but that is a tenet very different from the one stated in the quotation just made. If Dr. Bode answers this question in the affirmative, then it appears to me that he too, as well as Dr. Watson, "is dealing with an obfuscation that can not but be deplored."

HENRY RUTGERS MARSHALL.

NEW YORK.

RECOGNIZING that there can be no international peace until the great enemy of internationalism is defeated, the trustees of the Carnegie Endowment for International Peace have voted to put all its resources at the service of the government of the United States in order to assist in the preparation of a matured and constructive policy when peace shall be possible. The following is from the printed announcement:

"The Endowment has accordingly sought to bring about due preparation in two ways. In the first place, it has published or contributed to the publication of a series of works which furnish the same kind of foundation for effective consideration of the questions which will arise in a Peace Conference that Madison's Notes and Elliot's Debates, and the Federalist, and the earlier history of the development of Constitutional Law in the United States furnish for the consideration of inter-state questions in America. Until this publication many of these works were inaccessible and not widely known.

The other method of contributing to this preparation has been through active cooperation with the officers of the government whose official positions will throw upon them responsibility for the representation of the United States in the Peace Conference. At the meeting of April 19, 1917, the Board of Trustees adopted the following resolution:

> *Resolved,* That the Carnegie Endowment for International Peace offers to the government the services of its Division of International Law, its personnel and equipment, for dealing with the pressure of international business incident to the war.

That offer was accepted; and in effect the entire personnel and plant of the Division of International Law is being used by the government, and the activities of this institution are practically serving the government in making real, thorough, and scientific preparation for exercising the influence of the United States after the close of the war, and that activity is taking the place of agitation for peace, which we abjure until the war is won."

DR. MABEL FERNALD, formerly diagnostician in the Social Hygiene Laboratory at Bedford Hills Reformatory, N. Y., and Dr. Margaret Cobb have received appointments to the Army Medical Department at Washington.

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